

CLAIMS:

1. A method of changing the temperature of a liquid sample, comprising:
 - (i) providing a receptacle having inner and outer walls defining an annular portion therebetween for receiving therein said liquid sample,
 - 5 (ii) inserting said liquid sample, at a first temperature, into said annular portion, and
 - (iii) exposing said receptacle to a second temperature different from said first temperature.
2. The method according to claim 1, wherein the liquid is a biological sample.
- 10 3. The method according to claim 2, wherein the biological sample comprises sperm.
4. The method according to claim 1, wherein the receptacle has a longitudinal axis, a proximal end and a distal end, and the inner wall defines an inner space extending along said longitudinal axis.
- 15 5. The method according to Claim 1, wherein the receptacle has a longitudinal axis and a substantially round cross-section taken perpendicularly to the longitudinal axis.
6. The method according to claim 4, wherein the inner space is open at both the proximal end and distal end of the receptacle.
- 20 7. The method according to claim 4, further comprising providing an environment with a temperature gradient in a given direction and wherein step (iii) is performed at least partially by passing the receptacle in said environment along said direction, with the longitudinal axis of the receptacle being parallel to said direction.
- 25 8. The method according to claim 4, wherein the annular portion of the receptacle is sealed at the distal end and sealable at the proximal end of the receptacle.

9. The method according to claim 8, wherein the annular portion is sealable at the proximal end of the receptacle by a plug having a corresponding annular sealing portion.

10. The method according to claim 9, wherein the plug has a bore surrounded by the annular sealing portion and said bore is adapted to be aligned with the inner space of the receptacle providing a passage thereto.

11. The method according to claim 9, wherein the plug is made of a resilient material.

12. The method according to any one of Claims 9 to 11, wherein the method further comprises after step (ii), sealing the annular portion at the proximal end of the receptacle with the annular sealing portion of the plug.

13. The method according to any one of claims 9 to 12, wherein there is a wand associated with the plug, and wherein the step of sealing the annular portion of the receptacle at the proximal end thereof is performed by:

15 (a) inserting the plug into the proximal end of the receptacle so that a portion of said wand enters the annular portion of the receptacle together with said annular sealing portion of the plug, whereby sealing of the annular portion of the receptacle is prevented in the area of contact of the wand with one of the inner or outer walls of the receptacle, and

20 (b) removing the wand such that the proximal end of the annular portion of the receptacle becomes fully sealed.

14. The method according to claim 1, wherein step (iii) comprises providing a heat transfer fluid at the second temperature for flowing around the receptacle and 25 in the inner space.

15. The method according to claim 6, wherein step (iii) comprises providing a heat transfer fluid at the second temperature for flowing around the receptacle and into the inner space via one of the proximal or distal ends and out of the other.

16. The method according to claim 15 further comprising, before step (iii):

(I) providing a conduit tightly insertable in the inner space of the receptacle at the proximal end thereof, being adapted to direct the heat transfer fluid flowing out of the inner space so as not to enter the annular portion, and

s (II) inserting said conduit into the inner space at said proximal end.

17. The method according to claim 16, wherein the conduit is configured, such that the flowing of the heat transfer fluid therethrough imparts rotation to the receptacle.

18. A receptacle having proximal and distal ends, comprising:

10 – an inner wall and an outer wall defining an annular portion therebetween adapted for receiving liquid therein, and

– an inner space defined by said inner wall open at each of said proximal and a distal ends, enabling passage of fluid via said inner space whilst holding said liquid within said annular portion.

15 19. The receptacle according to claim 18, further comprising a conduit, adapted for insertion into the inner space so as to allow the fluid to exit therefrom via said conduit.

20. The receptacle according to claim 19, wherein said conduit is configured such that the flowing of a fluid therethrough imparts rotation to said receptacle.

21. A receptacle for use in changing the temperature of a biological sample, said sample being characterized by a cross-sectional dimension along which the change of temperature may be performed with a predetermined acceptable resultant quality of the sample, said receptacle comprising an inner wall and an outer wall defining an annular portion therebetween for receiving said biological sample

25 therein, said annular portion having a distance between said inner wall and said outer wall not exceeding said cross-sectional dimension of the sample.

22. A chamber for facilitating changing the temperature of a liquid sample held within a receptacle, said receptacle comprising:

– proximal and distal ends;

- an inner wall and an outer wall defining an annular portion therebetween for receiving liquid therein; and
- an inner space defined by said inner wall open at each of said proximal and distal ends,

5 said chamber comprising:

- a cavity for receiving said receptacle, and
- an inlet for inputting a heat transfer fluid into said cavity.

23. The chamber according to claim 22, further comprising a manifold for distributing the heat transfer fluid through the inner space and around said
10 receptacle.

24. The chamber according to Claim 23, wherein the cavity is adapted to accommodate the distal end of the receptacle, and the manifold further comprises a projection adapted to be received into the inner space at the distal end of said receptacle.